WHAT IS CLAIMED IS

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     1. An image processing apparatus, comprising:

     an input unit inputting a color signal of a color space;

     a designating unit designating a color range

10   according to the input color signal;

     a black amount determining unit determining an amount of black for the input color signal by referring to a black generation condition corresponding to the designated color range,

15   wherein the designated color range is a range where a difference between a maximum amount of black and a minimum amount of black is small.

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     2. The image processing apparatus as claimed in claim 1, wherein the color signal of the color space includes components of lightness, chroma, and hue.

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3. The image processing apparatus as claimed in claim 1, wherein the designated color range is situated on a line passing through a basing point and a maximum chroma point, wherein the black generation condition defines a black generation function according to the maximum amount of black and the minimum amount of black of the designated color range.

4. The image processing apparatus as claimed in claim 3, wherein the basing point is a black point.

5. The image processing apparatus as claimed in claim 3, wherein the black generation function is inputted with a value of a distance between the basing point and the input color signal.

6.   The image processing apparatus as claimed
in claim 1, wherein when a black starting point situated
on the line passing through the basing point and the
maximum chroma point is Si, and when another black
starting point situated on a line passing through the
basing point and a white point is Li, the black amount
determining unit determines the amount of black
according to the black generation condition, and
coordinates for the basing point, Si, Li, and the input
color signal.

7.   The image processing apparatus as claimed
in claim 1, wherein the black amount determining unit
determines the amount of black by normalizing the black
generation function according to the input color signal.

8. The image processing apparatus as claimed in claim 6, wherein Si and Li are designated according to a factor leading to image degrading.

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9. The image processing apparatus as claimed in claim 6, wherein Si and Li are designated according

10 to a range of a prescribed color.

15 10. The image processing apparatus as claimed in claim 6, wherein Si and Li are designated according to a characteristic of an output apparatus.

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11. The image processing apparatus as claimed in claim 6, wherein Si is designated according to the hue of the input color signal.

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12. The image processing apparatus as claimed in claim 6, wherein Si is designated according to a length of a line connecting the basing point and the maximum chroma point.

13. The image processing apparatus as claimed in claim 6, wherein Si is designated according to black starting point data for hues of Red, Green, Blue, Cyan, Magenta, and Yellow.

14. The image processing apparatus as claimed in claim 8, wherein Si is designated according to the hue of the input color signal.

15. The image processing apparatus as claimed in claim 8, wherein Si is designated according to a length of a line connecting the basing point and the

5   maximum chroma point.

10   16. The image processing apparatus as claimed in claim 8, wherein Si is designated according to black starting point data for hues of Red, Green, Blue, Cyan, Magenta, and Yellow.

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17. The image processing apparatus as claimed in claim 10, wherein Si is designated according to the

20   hue of the input color signal.

25   18. The image processing apparatus as claimed

in claim 10, wherein Si is designated according to a length of a line connecting the basing point and the maximum chroma point.

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19. The image processing apparatus as claimed in claim 10, wherein Si is designated according to black

10 starting point data for hues of Red, Green, Blue, Cyan, Magenta, and Yellow.

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20. An image processing method comprising the steps of:

a) inputting a color signal of a color space;

b) designating a color range according to the

20 input color signal; and

c) determining an amount of black for the input color signal by referring to a black generation condition corresponding to the designated color range,

wherein the designated color range is a range

25 where a difference between a maximum amount of black and

a minimum amount of black is small.

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      21.   An image processing method comprising the steps of:

      a) inputting a color signal of a color space;

      b) designating a color range according to the

10   input color signal;

      c) determining an amount of black for the input color signal by referring to a black generation condition corresponding to the designated color range; and

15   d) creating a table indicative of the amount of black determined in step c),

      wherein the designated color range is a range where a difference between a maximum amount of black and a minimum amount of black is small.

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      22. A program recorded to be executed with an

25   image processing apparatus, comprising the steps of:

a) inputting a color signal of a color space;

b) designating a color range according to the input color signal; and

c) determining an amount of black for the input color signal by referring to a black generation condition corresponding to the designated color range,

wherein the designated color range is a range where a difference between a maximum amount of black and a minimum amount of black is small.

23. An image processing method for converting a color signal, being input to an image output apparatus, into a color material signal, the image processing method comprising the steps of:

defining a first line;

defining one or more second lines;

allocating one or more color material signals on the first and second lines; and

obtaining a color material signal situated between the first and second lines by interpolation according to the first and second lines.

24. The image processing method as claimed in claim 23, wherein the first line is an achromatic line in a reproducible color range of the image output apparatus, wherein except for the achromatic line, the one or more second lines are one or more lines situated within the reproducible color range of the image output apparatus.

25. The image processing method as claimed in claim 23, wherein the first line is a line extending between white and black, wherein the one or more second lines are one or more lines connecting black with one or more points situated between white and a primary color or a secondary color.

26. The image processing method as claimed in

claim 23, wherein the one or more color material signals allocated on the first and second lines are one or more signals of same color having different density.

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27. The image processing method as claimed in claim 23, wherein the one or more color material signals

10 allocated on the first and second lines are one or more signals of black.

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28. The image processing method as claimed in claim 27, wherein the one or more color material signals of black are allocated to be black starting points at which graininess is unnoticeable.

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29. The image processing method as claimed in

25 claim 23, wherein the one or more color material signals

are allocated according to a designation of a user.

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     30.   The image processing method as claimed in claim 23, further comprising a step of creating a table indicative of the obtained color material signal corresponding to the input color signal.

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     31. An image processing apparatus comprising:

15   a CPU,

     wherein the CPU converts an input color signal into a color material signal by referring to the table as set forth in claim 30.

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     32. An image processing method for converting a color signal, being input to an image output apparatus,

25   into a color material signal, the image processing

method comprising the steps of:

defining a first line;

defining one or more second lines;

defining one or more third lines;

5   allocating one or more color material signals
on the first, second, and third lines; and

obtaining a color material signal situated
between any of the first, second, and third lines by
interpolation according to the first, second, and third
10   lines.

33.   The image processing method as claimed in
15   claim 32,

wherein the first line is an achromatic line
in a reproducible color range of the image output
apparatus, wherein the one or more second lines are one
or more lines situated on an outermost boundary line of
20   the reproducible color range, wherein except for the
achromatic line, the one or more third lines are one or
more lines situated within the reproducible color range
of the image output apparatus.

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34. The image processing method as claimed in claim 32, wherein the first line is a line extending between white and black, wherein the one or more second lines are one or more lines extending between black and a primary color and/or a secondary color, wherein the one or more third lines are one or more lines passing through a color range for memory color.

35. The image processing method as claimed in claim 34, wherein the memory color includes human skin color, ocean blue color, sky blue color, and plant green color.

36. The image processing method as claimed in claim 32, wherein the first line is a line extending between white and black, wherein the one or more second lines are one or more lines extending between black and

a primary color and/or a secondary colors wherein the one or more third lines are one or more lines connecting black with one or more points situated between white and a primary color or a secondary color.

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37. The image processing method as claimed in claim 32, wherein the one or more color material signals allocated on the first, second, and third lines are one or more signals of same color having different density.

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38. The image processing method as claimed in claim 32, wherein the one or more color material signals allocated on the first, second, and third lines are one or more signals of black.

39. The image processing method as claimed in

claim 38, wherein the one or more color material signals
of black allocated on the one or more third lines are
allocated to determine a maximum amount of black for a
black signal situated between the first line and the one
5   or more third lines.

10   40. The image processing method as claimed in
claim 38, wherein the one or more color material signals
of black allocated on the one or more second lines are
allocated to determine a maximum amount of black for the
one more color materials of black and obtain a maximum
15   range for the reproducible color range.

20   41. The image processing method as claimed in
claim 38, wherein the one or more color material signals
of black are allocated to be black starting points at
which graininess is unnoticeable.

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42. The image processing method as claimed in claim 32, wherein the one or more color material signals are allocated according to a designation of a user.

43. The image processing method as claimed in claim 32, wherein the one or more third lines are controlled according to a characteristic of an input image.

44. The image processing method as claimed in claim 32, further comprising a step of creating a table indicative of the obtained color material signal corresponding to the input color signal.

45. An image processing apparatus comprising:

a CPU,

wherein the CPU converts an input color signal into a color material signal by referring to the table

5 as set forth in claim 44.